FIG.1A

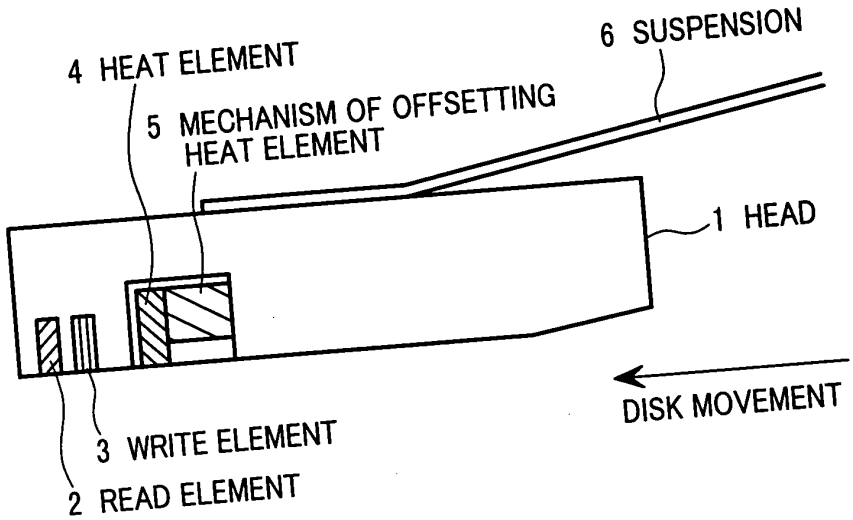
4 HEAT ELEMENT
5 MECHANISM OF OFFSETTING HEAT ELEMENT
6 SUSPENSION
1 HEAD
DISK MOVEMENT
3 WRITE ELEMENT
2 READ ELEMENT

FIG.1B

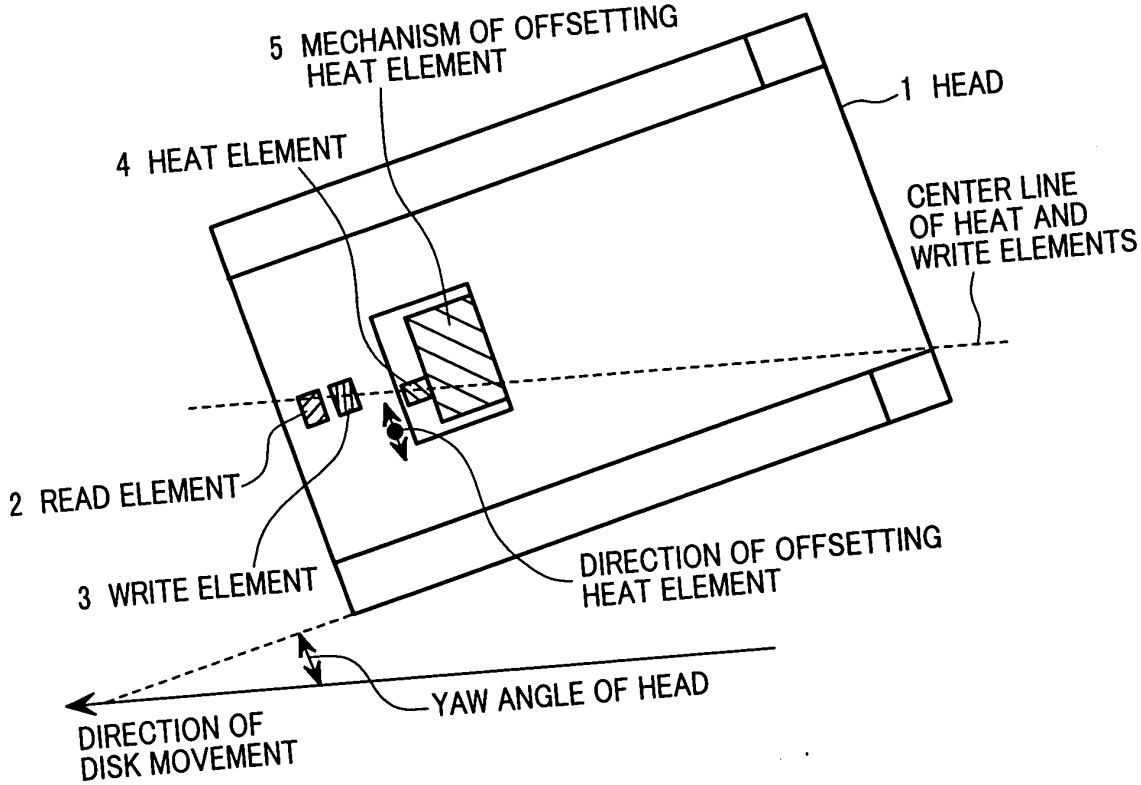
5 MECHANISM OF OFFSETTING HEAT ELEMENT
1 HEAD
4 HEAT ELEMENT
CENTER LINE OF HEAT AND WRITE ELEMENTS
2 READ ELEMENT
3 WRITE ELEMENT
DIRECTION OF OFFSETTING HEAT ELEMENT
YAW ANGLE OF HEAD
DIRECTION OF DISK MOVEMENT

FIG.2

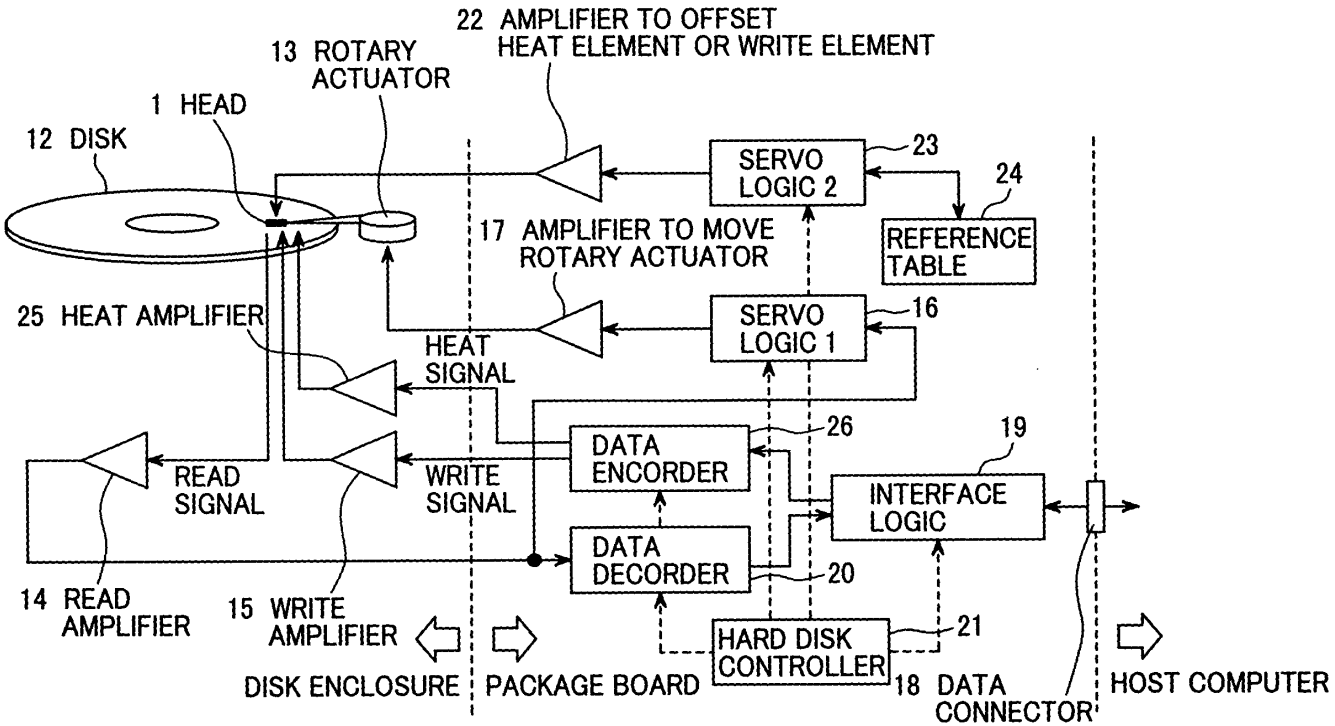
22 AMPLIFIER TO OFFSET
HEAT ELEMENT OR WRITE ELEMENT
13 ROTARY
ACTUATOR
1 HEAD
12 DISK
SERVO
LOGIC 2
23
24
REFERENCE
TABLE
17 AMPLIFIER TO MOVE
ROTARY ACTUATOR
25 HEAT AMPLIFIER
SERVO
LOGIC 1
16
HEAT
SIGNAL
DATA
ENCORDER
26
19
READ
SIGNAL
WRITE
SIGNAL
INTERFACE
LOGIC
DATA
DECORDER
20
14 READ
AMPLIFIER
15 WRITE
AMPLIFIER
HARD DISK
CONTROLLER
21
DISK ENCLOSURE
PACKAGE BOARD
18 DATA
CONNECTOR
HOST COMPUTER

FIG.3

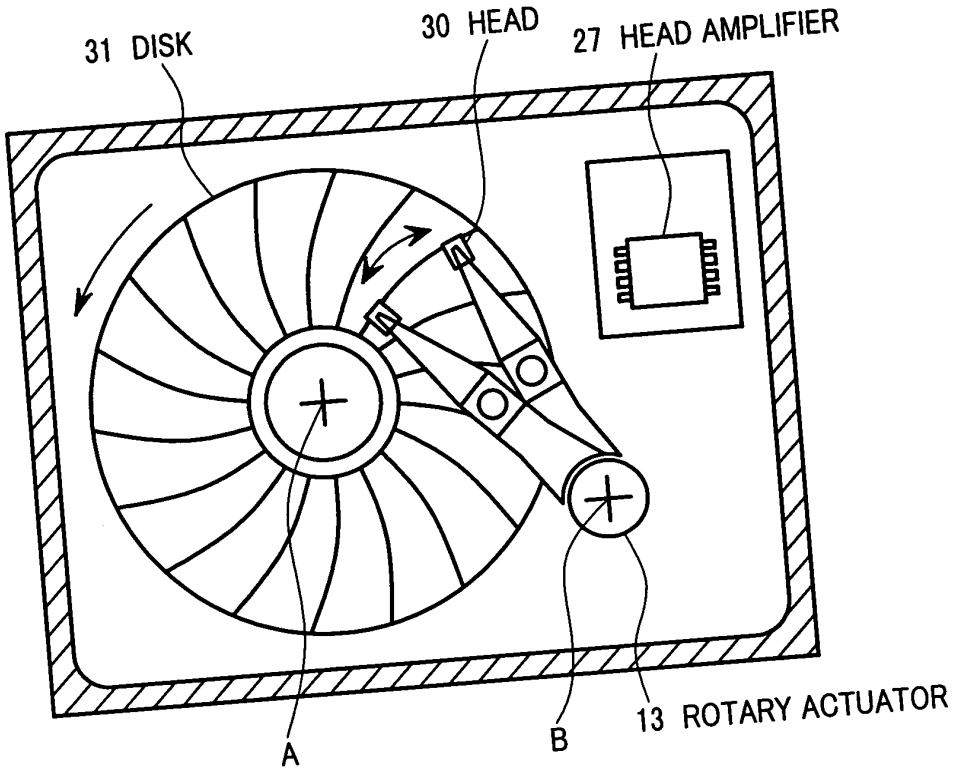
31 DISK
30 HEAD
27 HEAD AMPLIFIER
A
B
13 ROTARY ACTUATOR

FIG.4

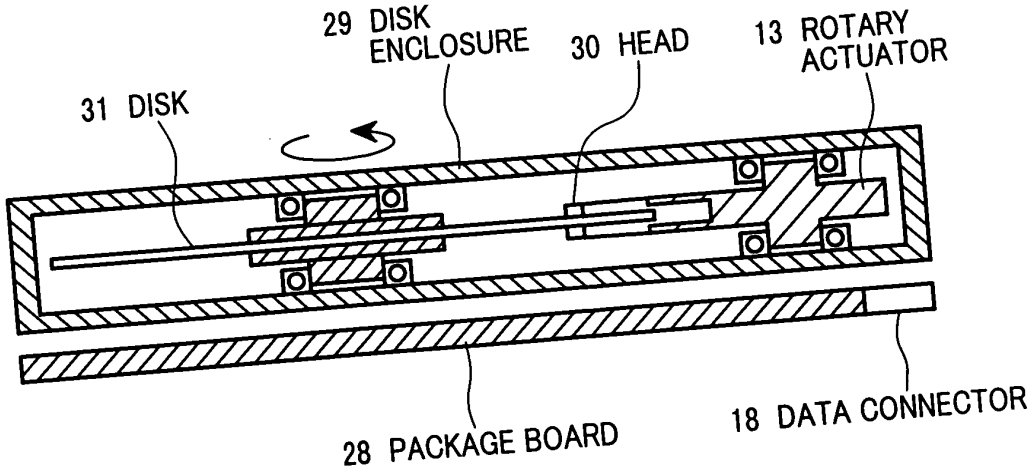
29 DISK ENCLOSURE
30 HEAD
13 ROTARY ACTUATOR
31 DISK
28 PACKAGE BOARD
18 DATA CONNECTOR

FIG.5A

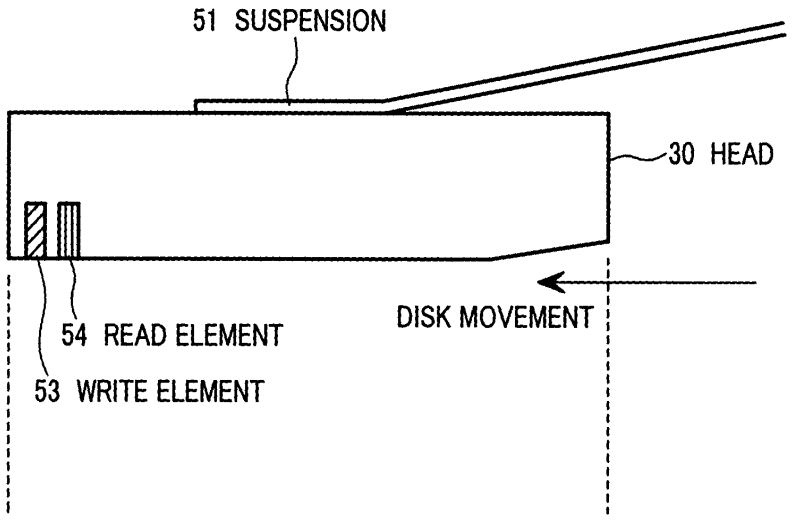
51 SUSPENSION
30 HEAD
54 READ ELEMENT
53 WRITE ELEMENT
DISK MOVEMENT

FIG.5B

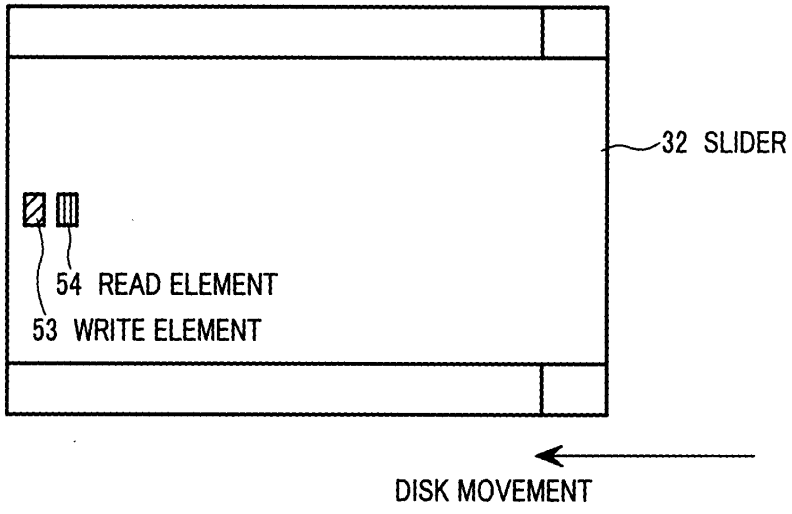
32 SLIDER
54 READ ELEMENT
53 WRITE ELEMENT
DISK MOVEMENT

FIG.6

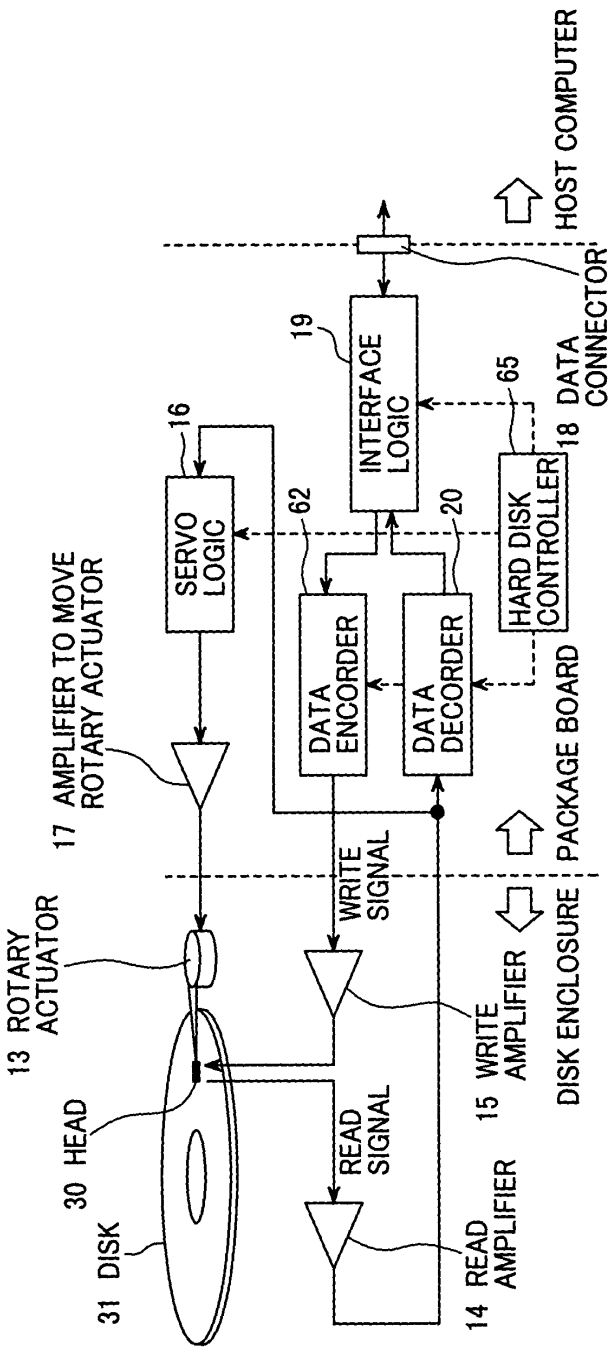
HOST COMPUTER
DATA CONNECTOR
18
65
19
INTERFACE LOGIC
16
SERVO LOGIC
62
20
HARD DISK CONTROLLER
DATA ENCORDER
DATA DECORDER
17 AMPLIFIER TO MOVE ROTARY ACTUATOR
WRITE SIGNAL
PACKAGE BOARD
13 ROTARY ACTUATOR
30 HEAD
31 DISK
READ SIGNAL
15 WRITE AMPLIFIER
14 READ AMPLIFIER
DISK ENCLOSURE

FIG.7

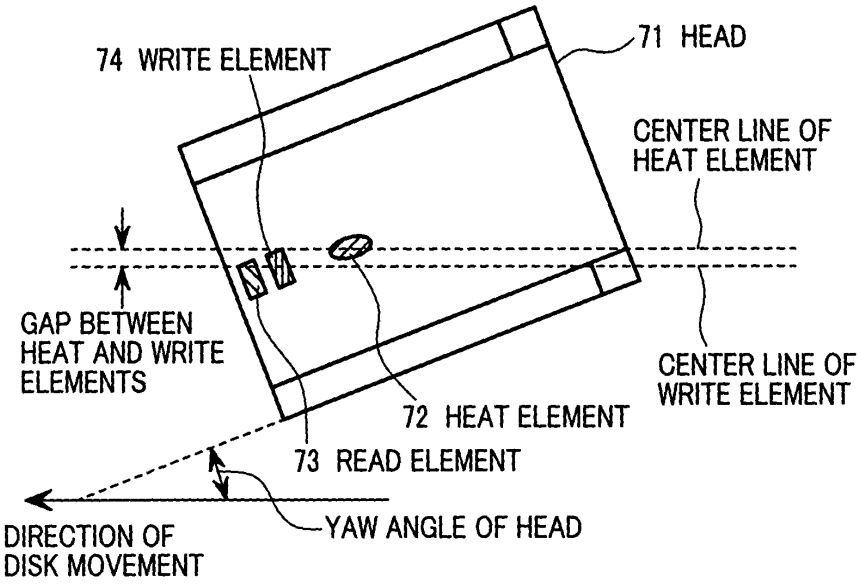
74 WRITE ELEMENT
71 HEAD
CENTER LINE OF HEAT ELEMENT
GAP BETWEEN HEAT AND WRITE ELEMENTS
CENTER LINE OF WRITE ELEMENT
72 HEAT ELEMENT
73 READ ELEMENT
YAW ANGLE OF HEAD
DIRECTION OF DISK MOVEMENT

FIG.9

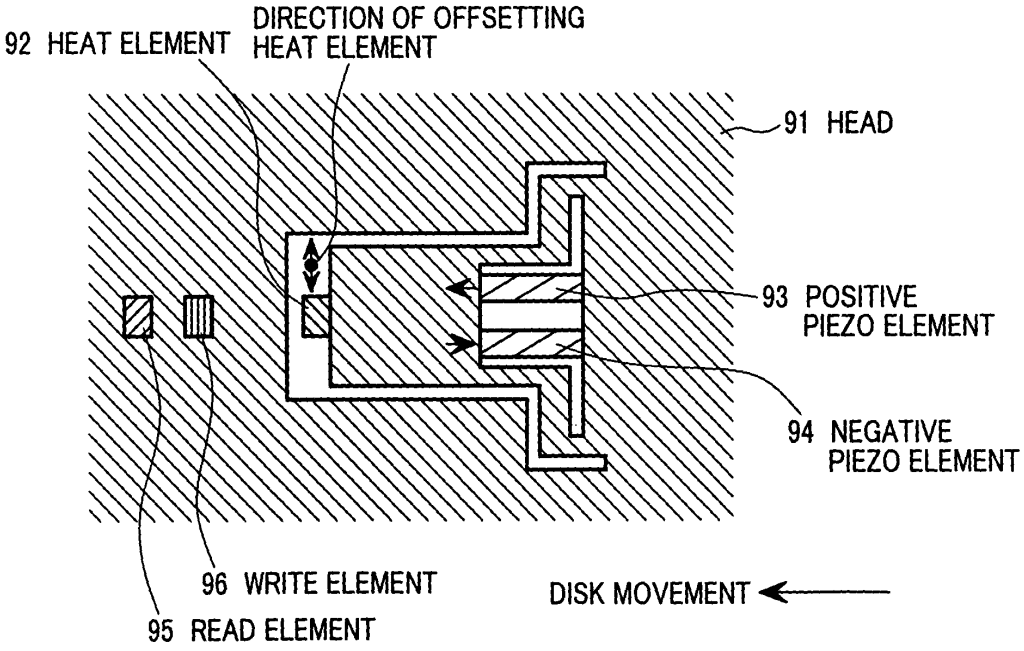
92 HEAT ELEMENT
DIRECTION OF OFFSETTING HEAT ELEMENT
91 HEAD
93 POSITIVE PIEZO ELEMENT
94 NEGATIVE PIEZO ELEMENT
96 WRITE ELEMENT
95 READ ELEMENT
DISK MOVEMENT

FIG.8A

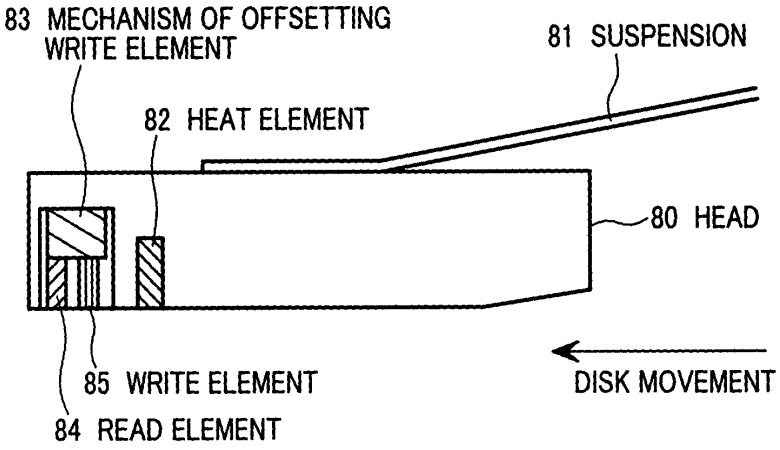
83 MECHANISM OF OFFSETTING WRITE ELEMENT
81 SUSPENSION
82 HEAT ELEMENT
80 HEAD
85 WRITE ELEMENT
84 READ ELEMENT
DISK MOVEMENT

FIG.8B

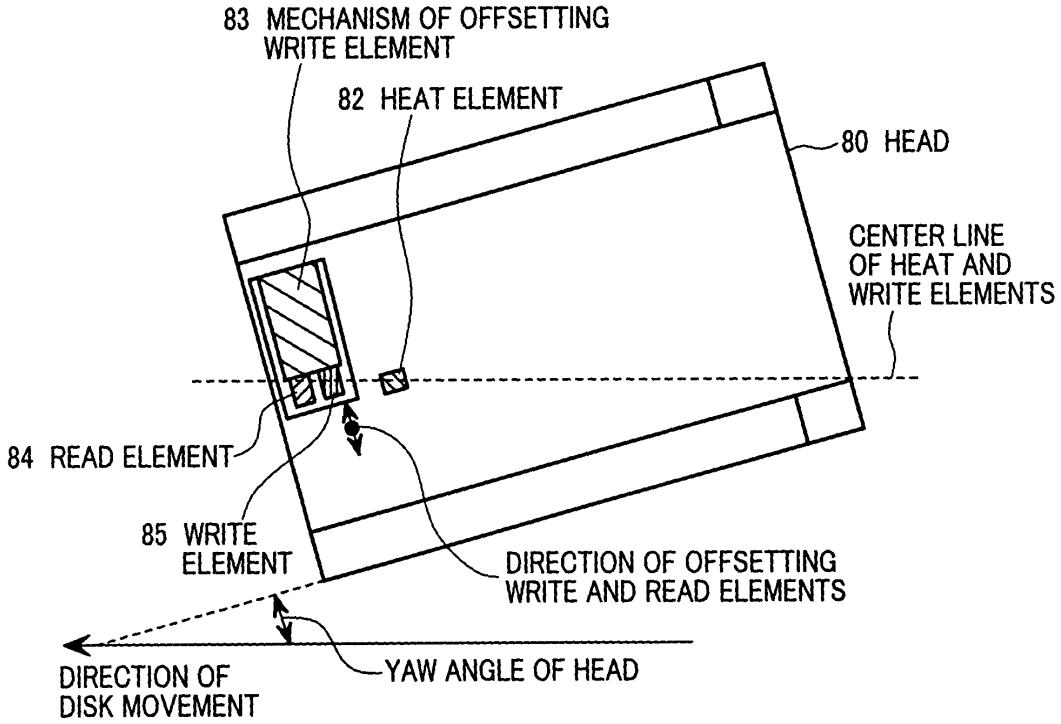
83 MECHANISM OF OFFSETTING WRITE ELEMENT
82 HEAT ELEMENT
80 HEAD
CENTER LINE OF HEAT AND WRITE ELEMENTS
84 READ ELEMENT
85 WRITE ELEMENT
DIRECTION OF OFFSETTING WRITE AND READ ELEMENTS
YAW ANGLE OF HEAD
DIRECTION OF DISK MOVEMENT

FIG.10A

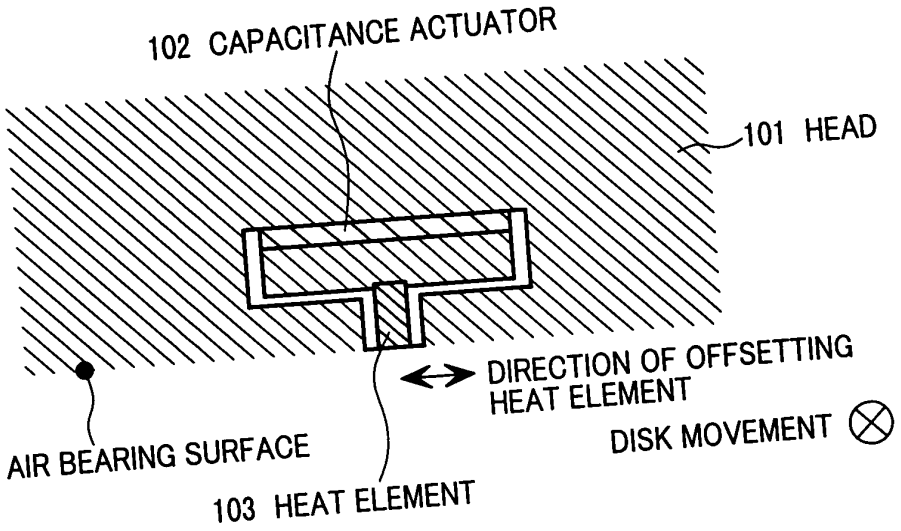

FIG.10B

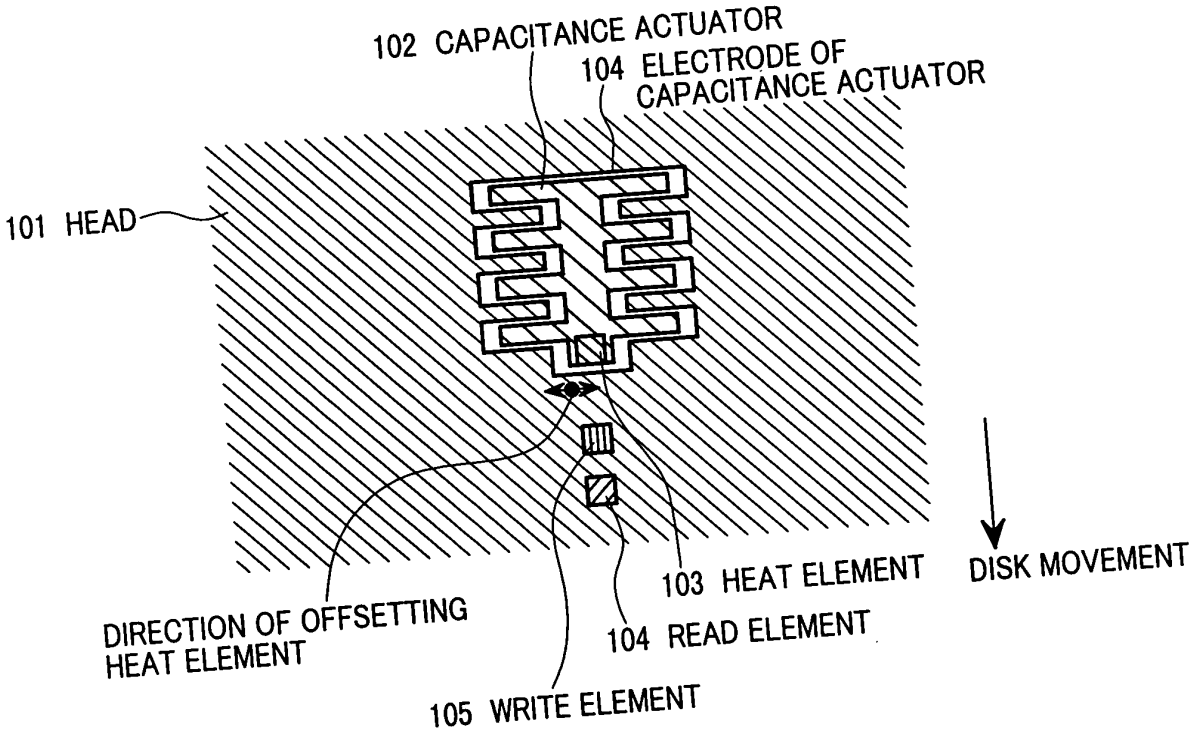

FIG.11

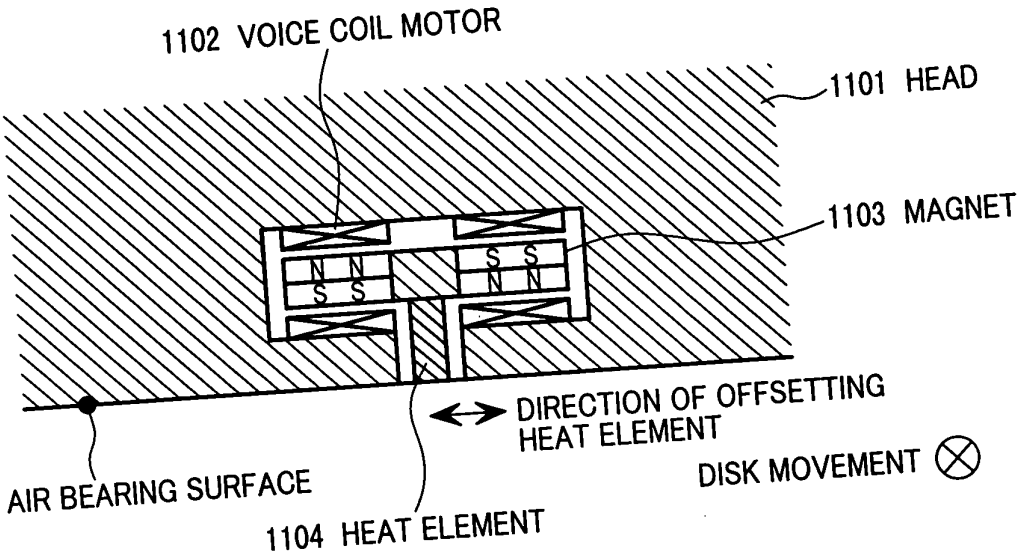
1102 VOICE COIL MOTOR
1101 HEAD
1103 MAGNET
N N
S S
S S
N N
DIRECTION OF OFFSETTING HEAT ELEMENT
DISK MOVEMENT
AIR BEARING SURFACE
1104 HEAT ELEMENT

FIG.12

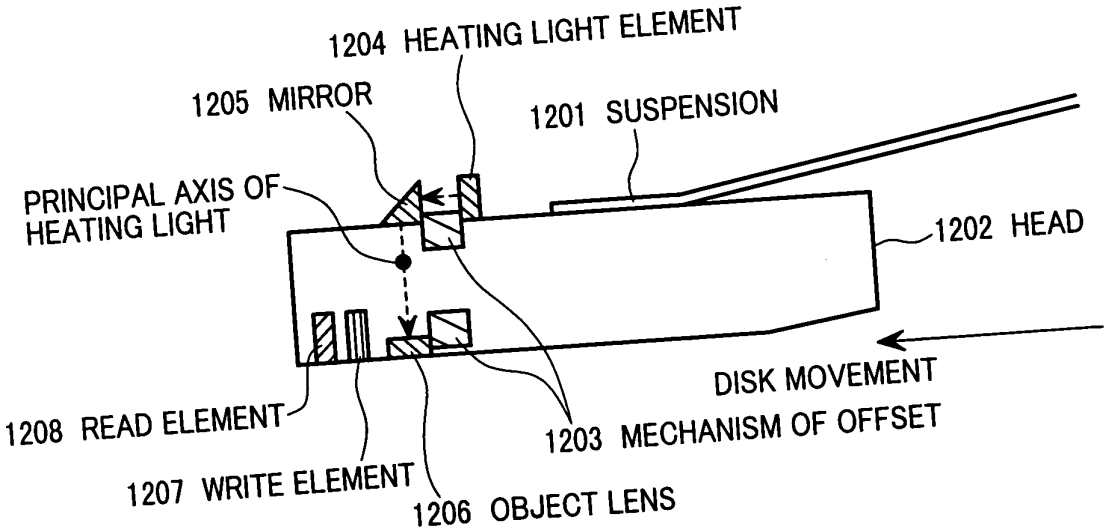
1204 HEATING LIGHT ELEMENT
1205 MIRROR
1201 SUSPENSION
PRINCIPAL AXIS OF HEATING LIGHT
1202 HEAD
DISK MOVEMENT
1208 READ ELEMENT
1203 MECHANISM OF OFFSET
1207 WRITE ELEMENT
1206 OBJECT LENS

FIG.13

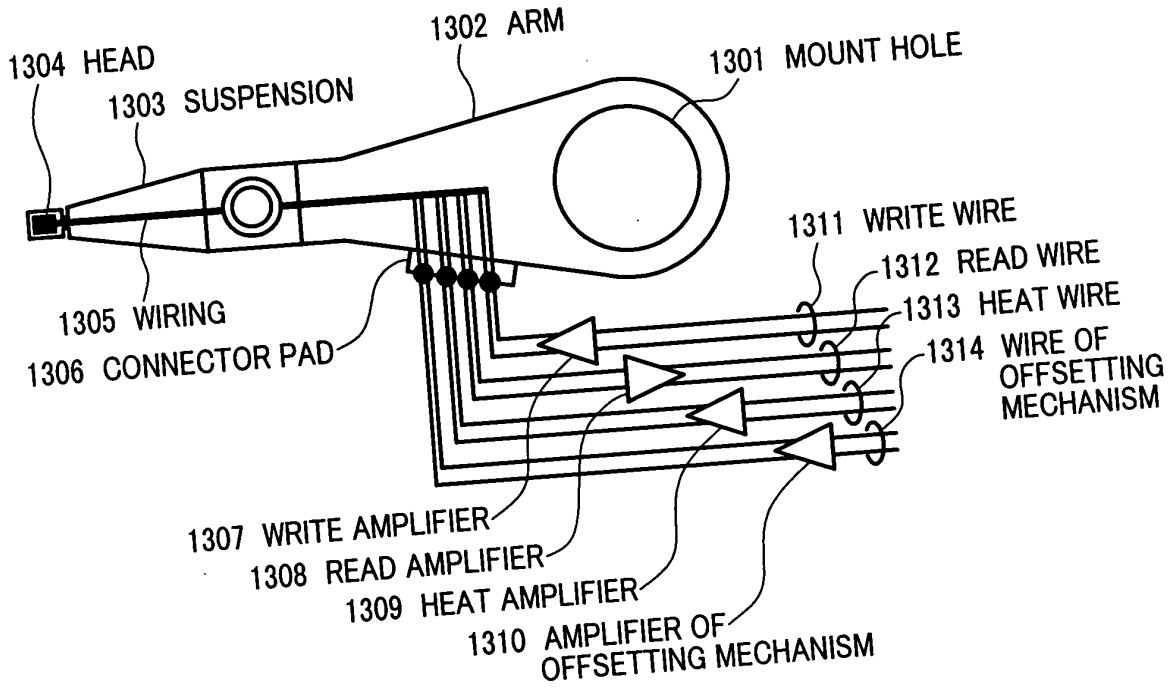
1304 HEAD
1303 SUSPENSION
1302 ARM
1301 MOUNT HOLE
1311 WRITE WIRE
1312 READ WIRE
1313 HEAT WIRE
1314 WIRE OF OFFSETTING MECHANISM
1305 WIRING
1306 CONNECTOR PAD
1307 WRITE AMPLIFIER
1308 READ AMPLIFIER
1309 HEAT AMPLIFIER
1310 AMPLIFIER OF OFFSETTING MECHANISM

FIG.14A

ZONE NUMBER	TRACK NUMBER	YAW ANGLE(°)
13	0	−15.2
12	2346	−13.7
11	4692	−12.2
10	7038	−10.6
9	9384	−9.0
8	11730	−7.3
7	14076	−5.6
6	16422	−3.8
5	18768	−1.8
4	21114	0.2
3	23460	2.4
2	25806	4.7
1	28152	7.3

FIG.14B

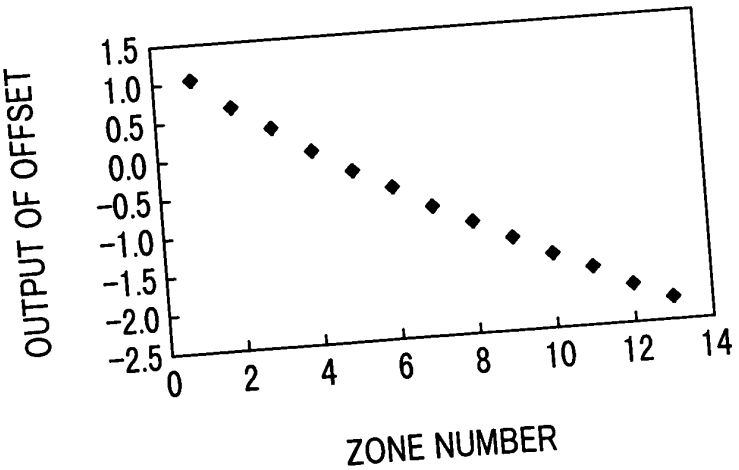

FIG.14C

TRACK NUMBER	TEMPERATURE= -15(°C)	TEMPERATURE= +5(°C)	TEMPERATURE= +25(°C)	TEMPERATURE= +45(°C)	TEMPERATURE= +65(°C)
0	-3.37	-2.77	-2.17	-1.57	-0.97
2346	-3.15	-2.55	-1.95	-1.35	-0.75
4692	-2.92	-2.32	-1.72	-1.12	-0.52
7038	-2.70	-2.10	-1.50	-0.90	-0.30
9384	-2.46	-1.86	-1.26	-0.66	-0.06
11730	-2.23	-1.63	-1.03	-0.43	0.17
14076	-1.98	-1.38	-0.78	-0.18	0.42
16422	-1.73	-1.13	-0.53	0.07	0.67
18768	-1.46	-0.86	-0.26	0.34	0.94
21114	-1.17	-0.57	0.03	0.63	1.23
23460	-0.87	-0.27	0.33	0.93	1.53
25806	-0.54	0.06	0.66	1.26	1.86
28152	-0.17	0.43	1.03	1.63	2.23

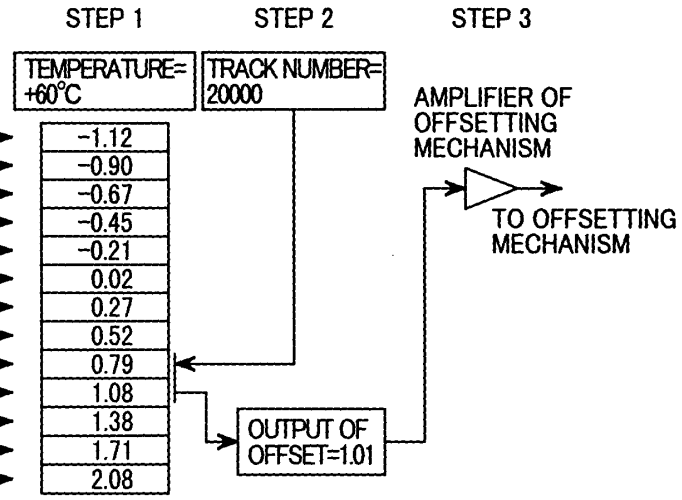

FIG.15

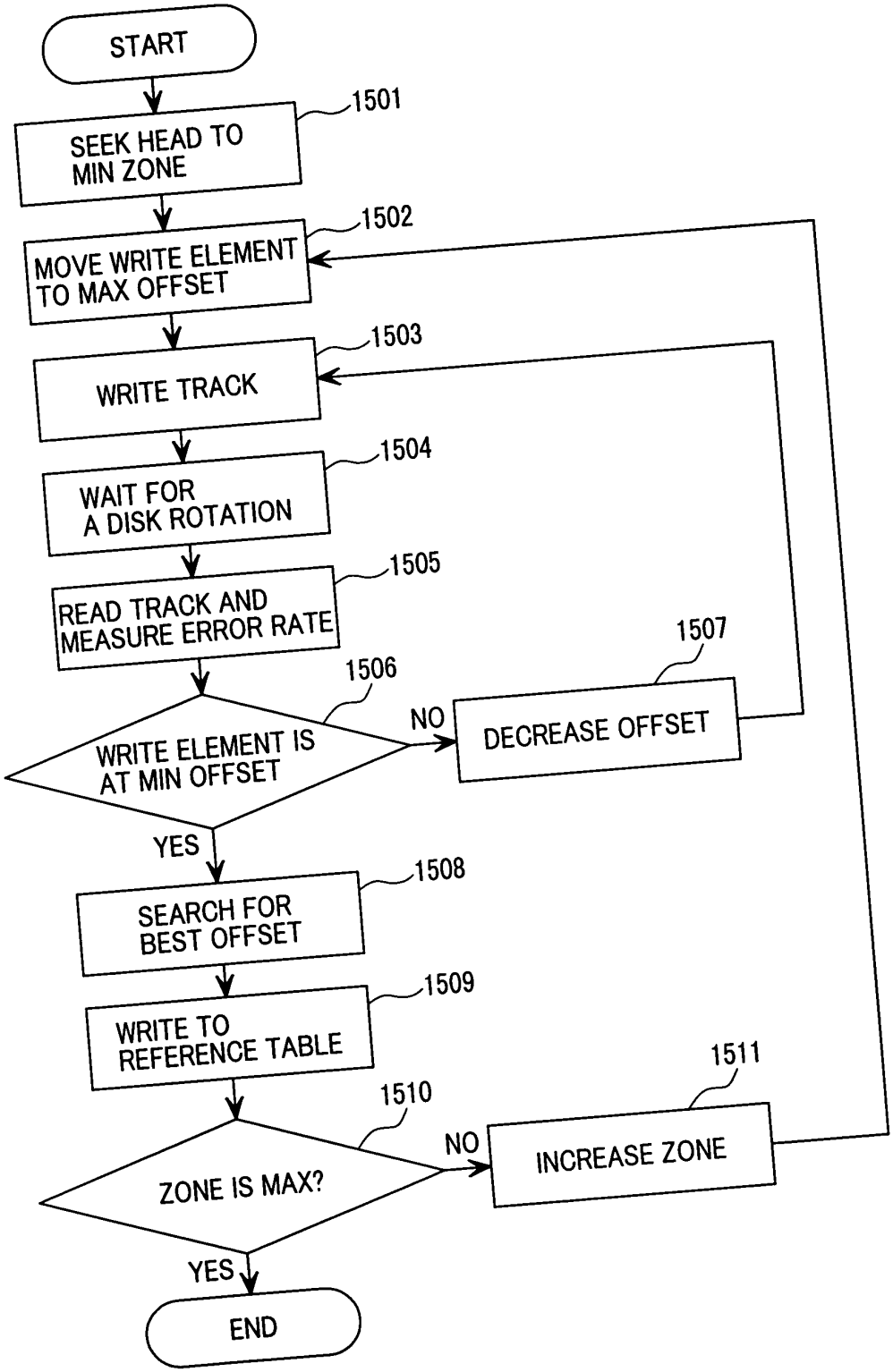
START
SEEK HEAD TO MIN ZONE
1501
MOVE WRITE ELEMENT TO MAX OFFSET
1502
WRITE TRACK
1503
WAIT FOR A DISK ROTATION
1504
READ TRACK AND MEASURE ERROR RATE
1505
WRITE ELEMENT IS AT MIN OFFSET
1506
NO
DECREASE OFFSET
1507
YES
SEARCH FOR BEST OFFSET
1508
WRITE TO REFERENCE TABLE
1509
ZONE IS MAX?
1510
NO
INCREASE ZONE
1511
YES
END

FIG.16A

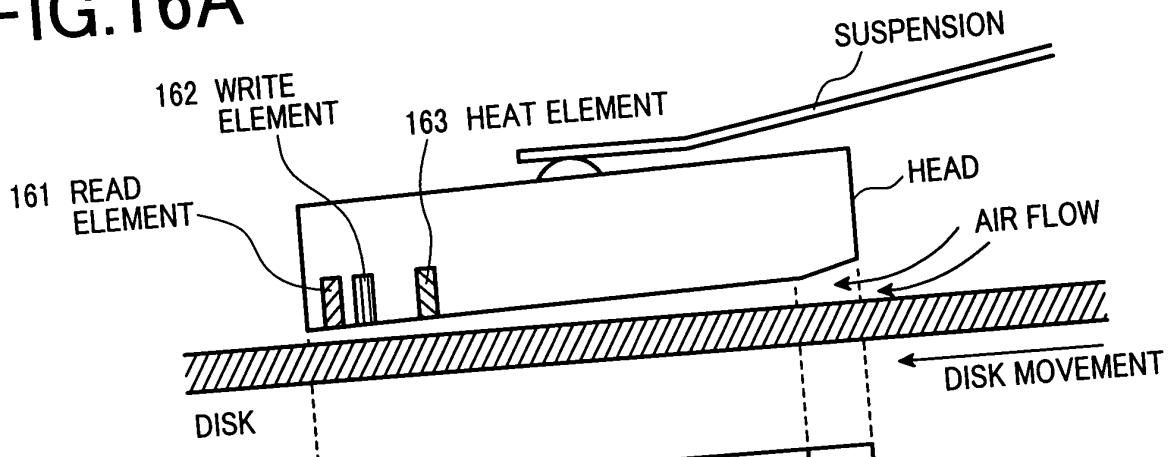

FIG.16B

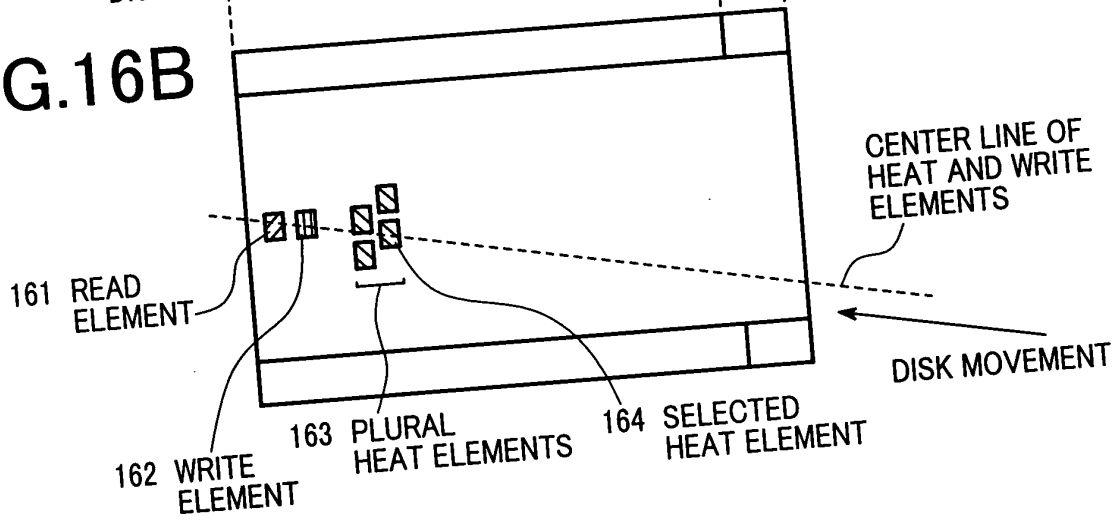

FIG.17

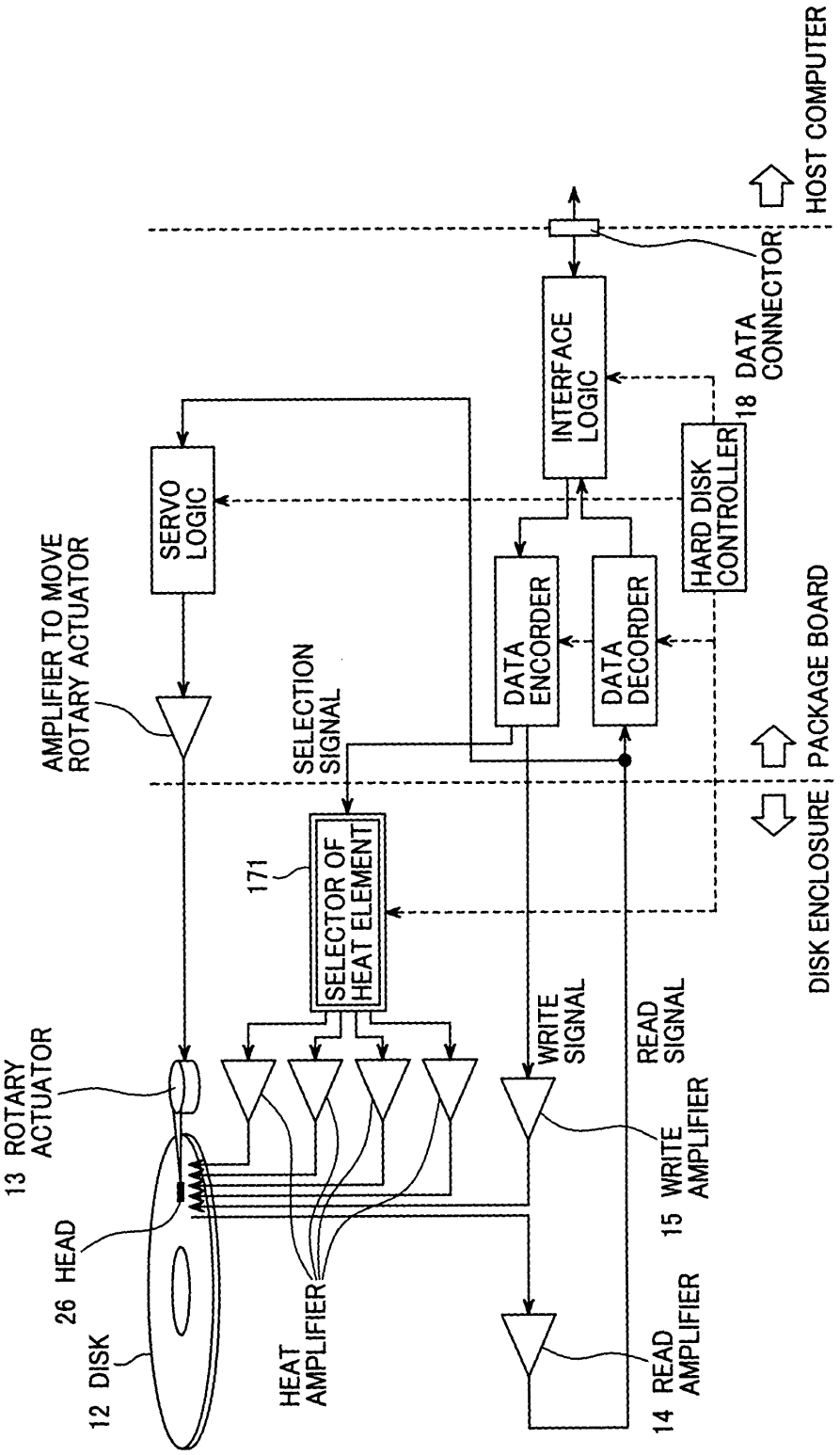
HOST COMPUTER
DISK ENCLOSURE
PACKAGE BOARD
DATA CONNECTOR
18
INTERFACE LOGIC
HARD DISK CONTROLLER
SERVO LOGIC
DATA ENCORDER
DATA DECORDER
AMPLIFIER TO MOVE ROTARY ACTUATOR
SELECTION SIGNAL
171
SELECTOR OF HEAT ELEMENT
WRITE SIGNAL
READ SIGNAL
13 ROTARY ACTUATOR
26 HEAD
12 DISK
HEAT AMPLIFIER
15 WRITE AMPLIFIER
14 READ AMPLIFIER

FIG.18

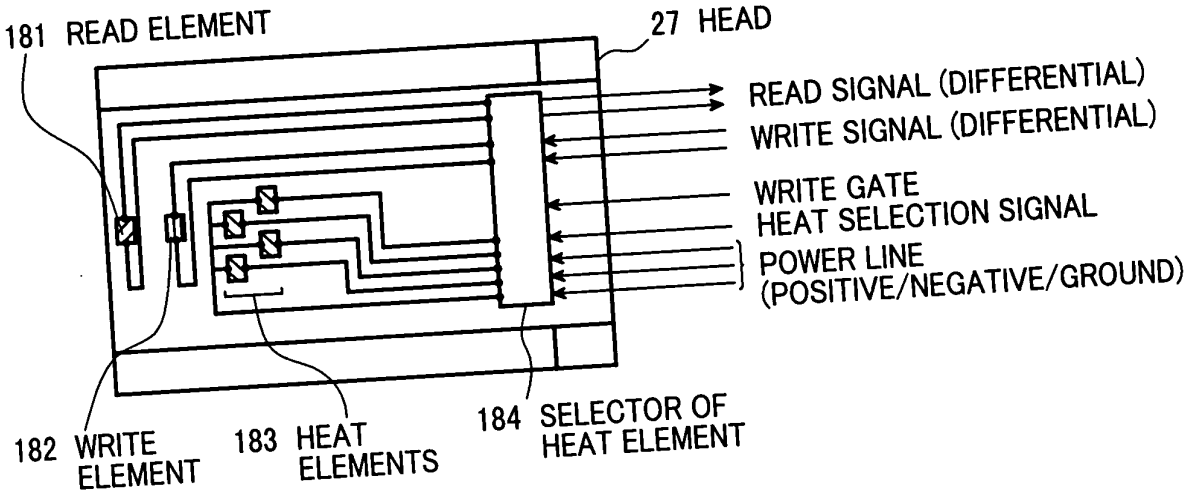
181 READ ELEMENT
27 HEAD
READ SIGNAL (DIFFERENTIAL)
WRITE SIGNAL (DIFFERENTIAL)
WRITE GATE
HEAT SELECTION SIGNAL
POWER LINE
(POSITIVE/NEGATIVE/GROUND)
182 WRITE ELEMENT
183 HEAT ELEMENTS
184 SELECTOR OF HEAT ELEMENT

FIG.19

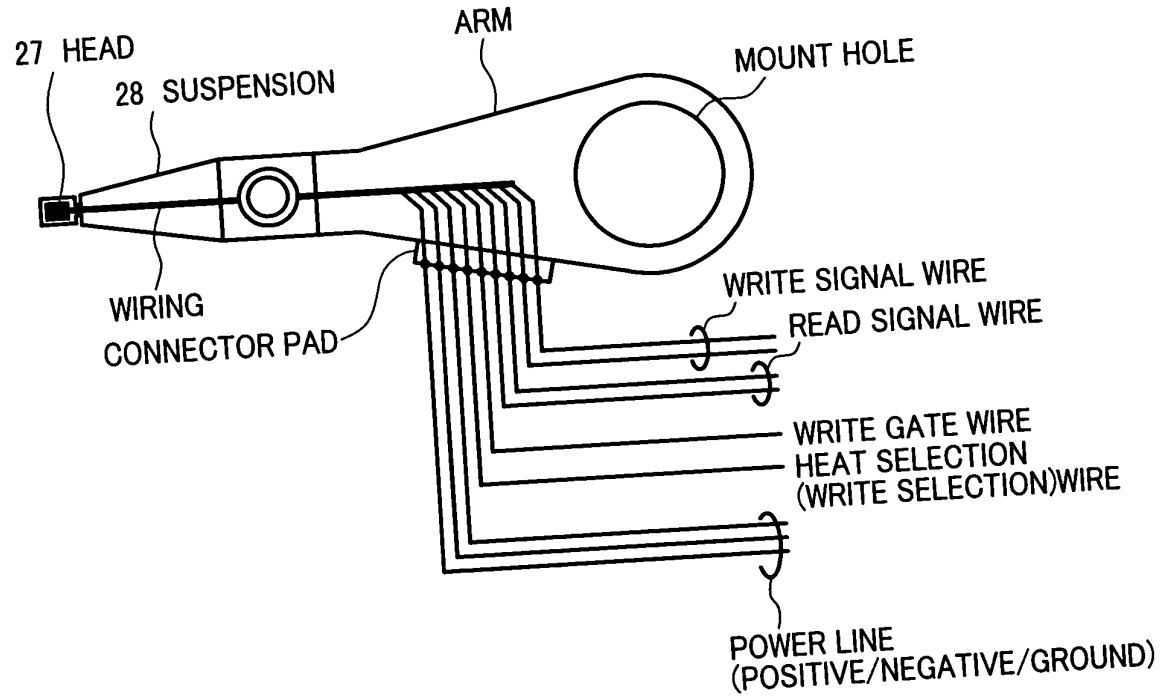
27 HEAD
28 SUSPENSION
ARM
MOUNT HOLE
WIRING
CONNECTOR PAD
WRITE SIGNAL WIRE
READ SIGNAL WIRE
WRITE GATE WIRE
HEAT SELECTION
(WRITE SELECTION)WIRE
POWER LINE
(POSITIVE/NEGATIVE/GROUND)

FIG.20

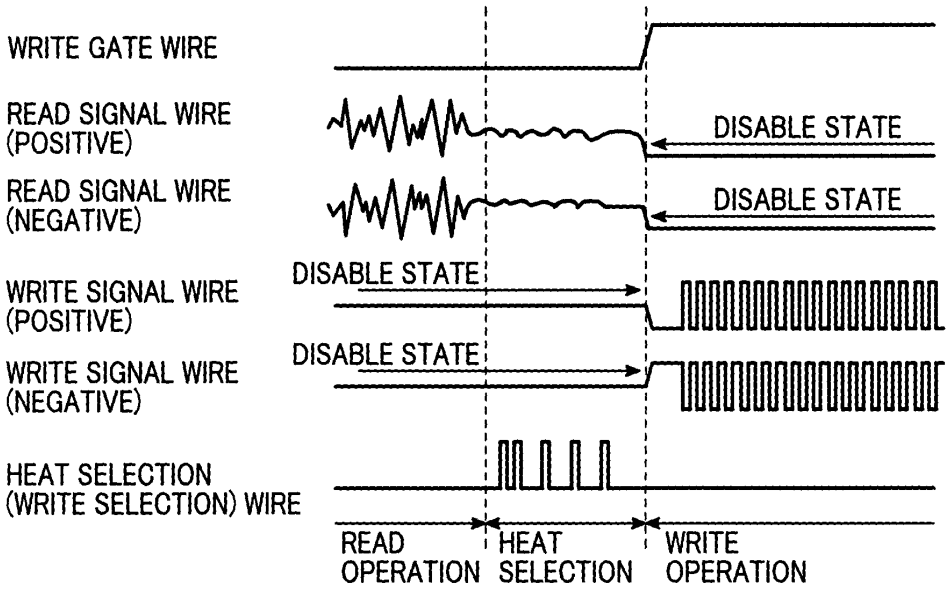
WRITE GATE WIRE
READ SIGNAL WIRE (POSITIVE)
DISABLE STATE
READ SIGNAL WIRE (NEGATIVE)
DISABLE STATE
DISABLE STATE
WRITE SIGNAL WIRE (POSITIVE)
DISABLE STATE
WRITE SIGNAL WIRE (NEGATIVE)
HEAT SELECTION (WRITE SELECTION) WIRE
READ OPERATION
HEAT SELECTION
WRITE OPERATION

FIG.21A

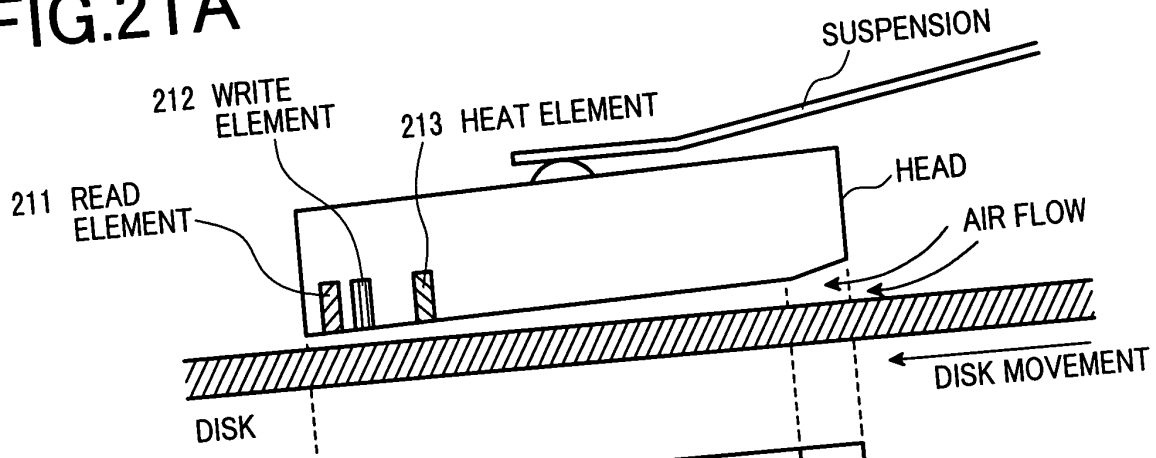

FIG.21B

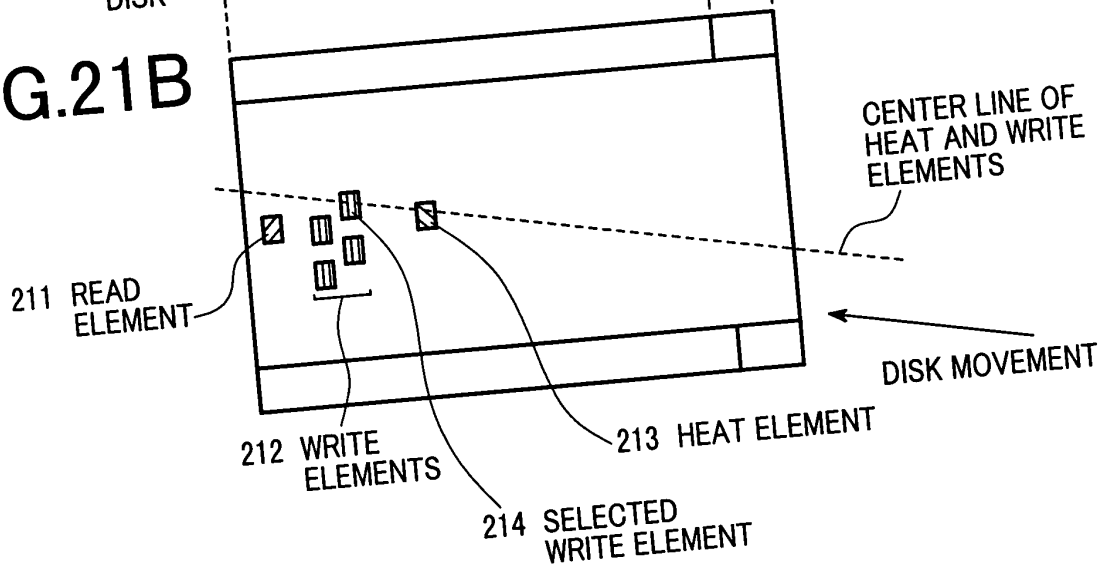

FIG.22

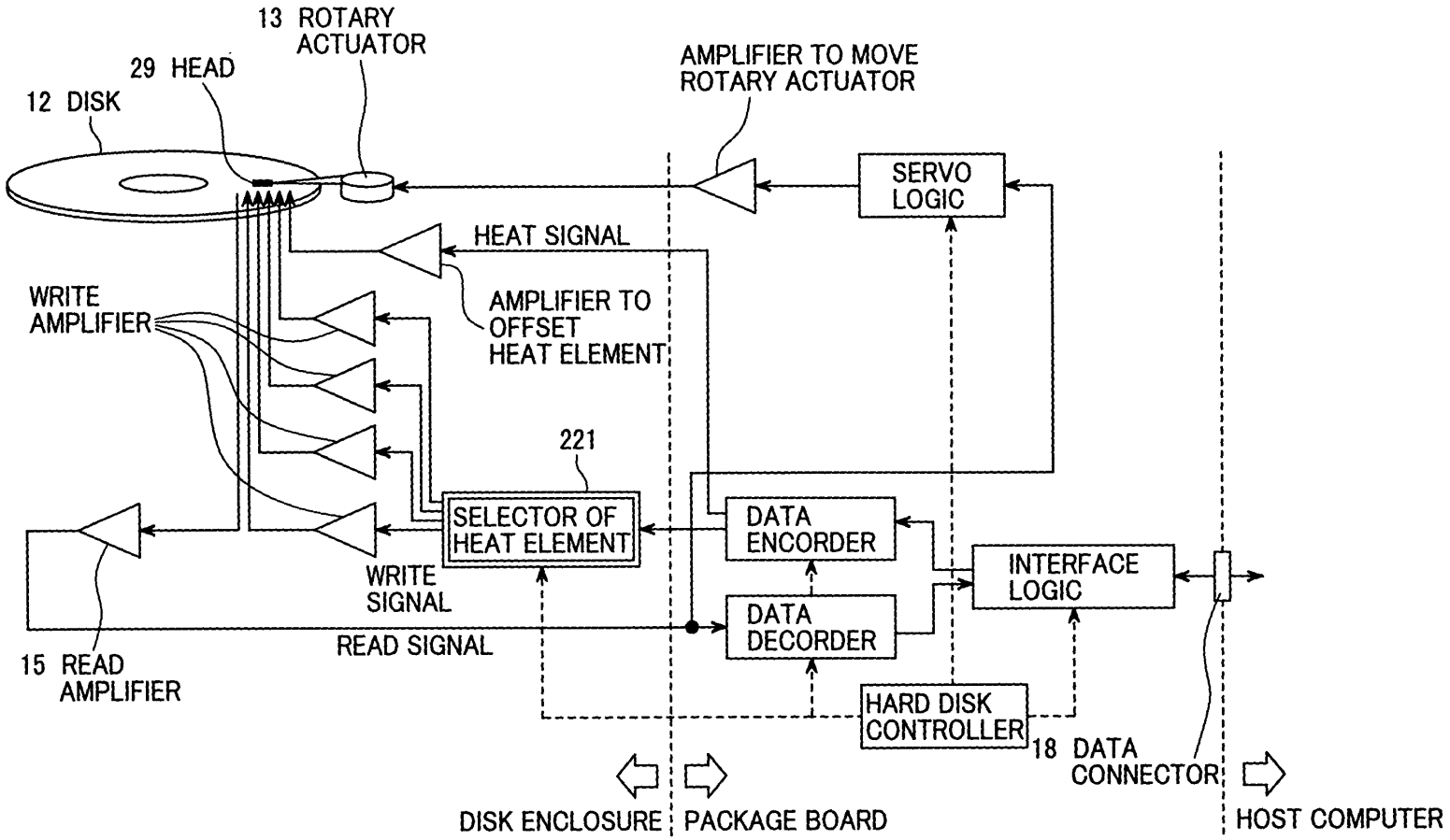
13 ROTARY ACTUATOR
29 HEAD
12 DISK
AMPLIFIER TO MOVE ROTARY ACTUATOR
SERVO LOGIC
HEAT SIGNAL
AMPLIFIER TO OFFSET HEAT ELEMENT
WRITE AMPLIFIER
221
SELECTOR OF HEAT ELEMENT
DATA ENCORDER
INTERFACE LOGIC
WRITE SIGNAL
DATA DECORDER
READ SIGNAL
15 READ AMPLIFIER
HARD DISK CONTROLLER
18 DATA CONNECTOR
DISK ENCLOSURE
PACKAGE BOARD
HOST COMPUTER

FIG.23

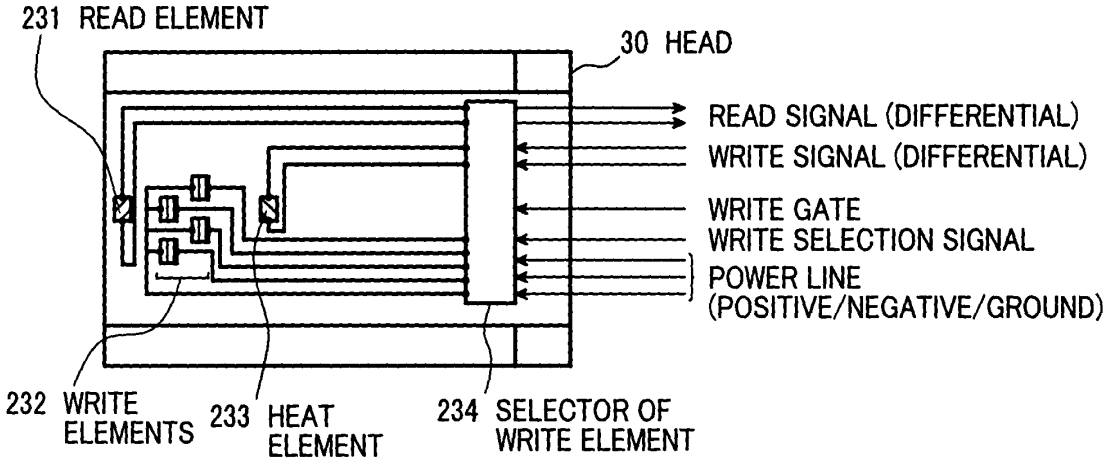
231 READ ELEMENT
30 HEAD
READ SIGNAL (DIFFERENTIAL)
WRITE SIGNAL (DIFFERENTIAL)
WRITE GATE
WRITE SELECTION SIGNAL
POWER LINE
(POSITIVE/NEGATIVE/GROUND)
232 WRITE ELEMENTS
233 HEAT ELEMENT
234 SELECTOR OF WRITE ELEMENT

FIG.25

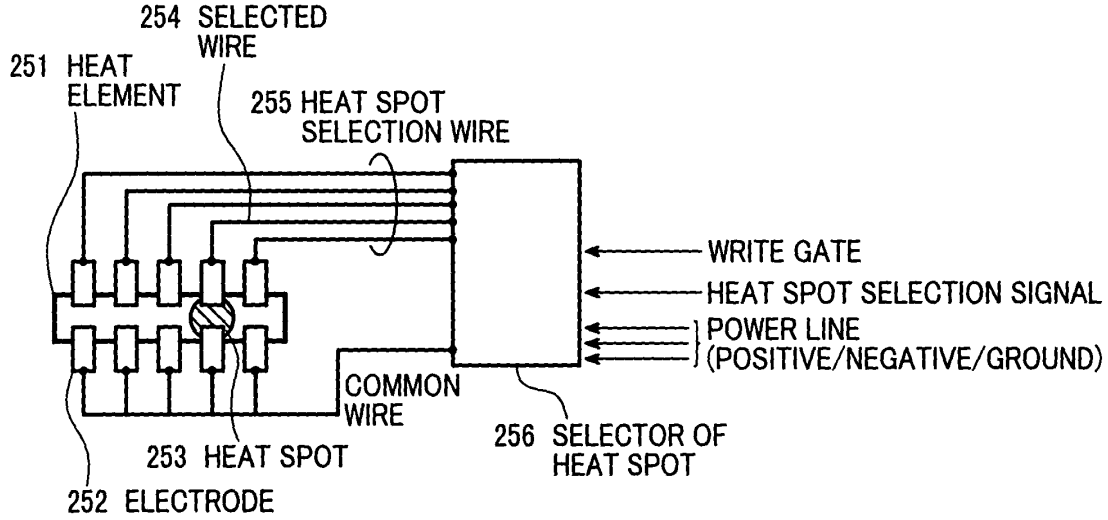
254 SELECTED WIRE
251 HEAT ELEMENT
255 HEAT SPOT SELECTION WIRE
WRITE GATE
HEAT SPOT SELECTION SIGNAL
POWER LINE
(POSITIVE/NEGATIVE/GROUND)
COMMON WIRE
256 SELECTOR OF HEAT SPOT
253 HEAT SPOT
252 ELECTRODE

FIG.24A

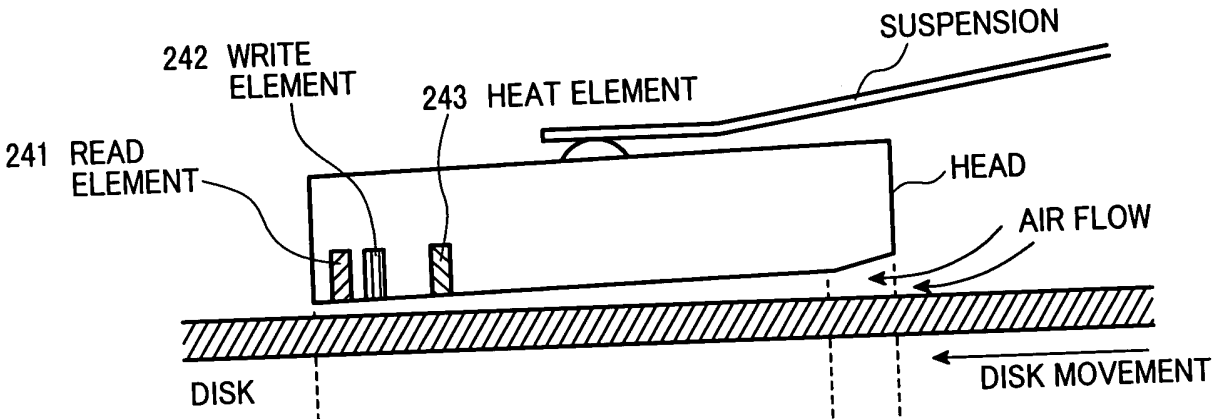
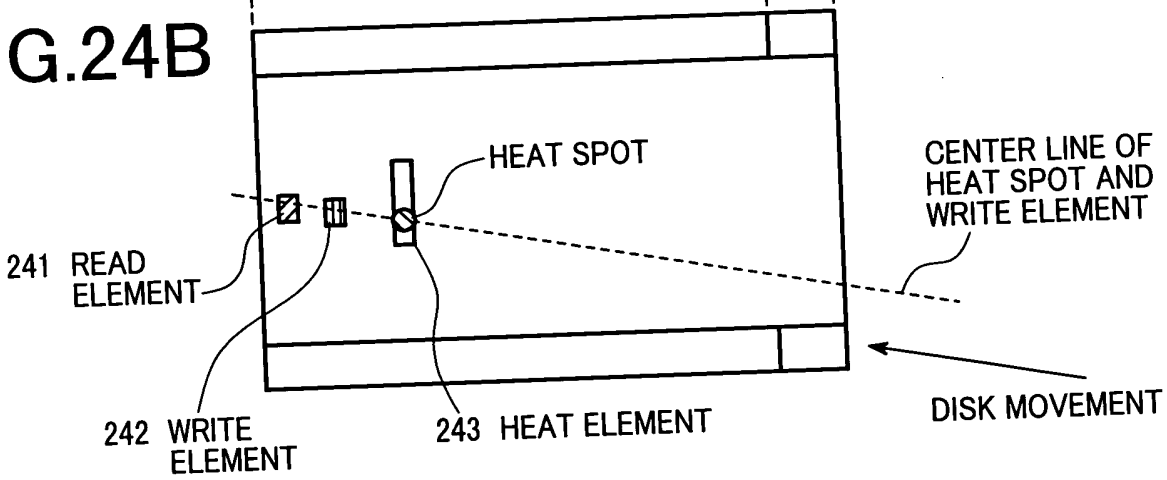
FIG.24B